BATCH - Bug # 1323: why "atmos" jobs beat up the database

Status:	Resolved	**Priority:**	High
Author:	Art Kreymer	**Category:**	
Created:	05/25/2011	**Assigned to:**	Robert Hatcher
Updated:	05/27/2011	**Due date:**	
Subject:	why "atmos" jobs beat up the database		

Description:

Date: Tue, 24 May 2011 16:55:53 -0500
From: Robert Hatcher <rhatcher@fnal.gov>
To: Minos Mailing List <MINOS_SOFTWARE_DISCUSSION@listserv.fnal.gov>
Cc: Andy Blake <blake@hep.phy.cam.ac.uk>
Subject: MINOS: why "atmos" jobs beat up the database

In today's Batch meeting I said I'd look further into why the
database was getting hammered on the BEAMMONSPILL table.
Art, Rashid and I ruled out that this is somehow caused by
the keep-up jobs: the queries are on the dogwood1 DB and the
problem extends long beyond when the last of the morning's
keep-up files was complete. So it has to be the ongoing
"atmos" jobs.

I re-tested BDSpillAccessor and for a day's worth of sampling
at 1 second intervals it pulled only ~26 BEAMMONSPILL entries
(one every 2 hours + once for each 1 second gap between regular
entries). This is as I walked from T=2008-10-20 + 0 sec to
T'=20008-10-21 + 0 sec at querying 1 second intervals in order.

I had Rashid increase the verbosity of DBI and run one of
the "atmos" jobs that ran this morning during the time in
question. What we found was a flip flopping of SEQNO's,
that is SEQNO_1, backstop, SEQNO_1, backstop, SEQNO_1, backstop, ...
rather than SEQNO_1, backstop, SEQNO_N+1, etc...

At that point I made a test release and modified BDSpillAccessor
to print the VldTimeStamp it was passed and to give a traceback.
Access to BDSpillAccessor was coming from two places.
The problem I've found is there is a fundamental clash between
what AtNuOutput/NtpMaker::FillSpillInfo() is doing and what
Filtration/DataQualityInterface::ProcessBeamStatus() is doing.

In DataQualityInterface it starts with a VldContext and
uses SpillTimeFinder::GetNearestSpill() to construct a _new_ time
with which it will query the BDSpillAccessor. But in NtpMaker,
while it does get a SpillTimeND from SpillTimeFinder, it
nevertheless uses the time in the VldContext when querying
BDSpillAccessor.

Problems arise when SpillTimeFinder returns a new time that
isn't in the same SEQNO of BEAMMONSPILL (presumably because
the beam was actually off). Then the two start thrashing
each other's DBI caches and each new record triggers a query
for either (the real nearest spill) or (the BEAMMONSPILL that
covers the record's VldContext).

I think the easiest solution, but Andy must say if this somehow
invalidates some assumption, that AtNuOutput/NtpMaker.cxx lines
1310 to 1312 change from:

```
    const SpillTimeND& ndspill = stf.GetNearestSpill(vldc);

    const BeamMonSpill* bmspill = BDSpillAccessor::Get().LoadSpill(vldc.GetTimeStamp());
```

to:

```
    const SpillTimeND& ndspill = stf.GetNearestSpill(vldc);

    VldTimeStamp ts = vldc.GetTimeStamp();
    if ( ndspill ) ts = ndspill.GetTimeStamp()

    const BeamMonSpill* bmspill = BDSpillAccessor::Get().LoadSpill(ts);
```

History

05/25/2011 10:00 am - Art Kreymer

- % Done changed from 30 to 60

Date: Wed, 25 May 2011 15:47:45 +0100 (BST)
From: Andy Blake <blake@hep.phy.cam.ac.uk>
To: Robert Hatcher <rhatcher@fnal.gov>
Cc: Minos Mailing List <MINOS_SOFTWARE_DISCUSSION@listserv.fnal.gov>
Subject: Re: MINOS: why "atmos" jobs beat up the database

Hi Robert,

Thanks very much indeed for finding the problem!

I've committed your suggested change to CVS. Running some test jobs,
it looks to me like the repeated db queries go away.

Best Wishes,
Andy

05/25/2011 10:00 am - Art Kreymer

- % Done changed from 60 to 70

Date: Wed, 25 May 2011 09:52:34 -0500
From: Howard Rubin <rubin@iit.edu>
To: Andy Blake <blake@hep.phy.cam.ac.uk>
Cc: Robert Hatcher <rhatcher@fnal.gov>,
Minos Mailing List <MINOS_SOFTWARE_DISCUSSION@listserv.fnal.gov>
Subject: Re: MINOS: why "atmos" jobs beat up the database

Robert,

I've shut down the cron job and current processing should finish in somewhat under 2 hours.
Could you please then backport the changes to R2.0.5?

05/25/2011 10:46 am - Art Kreymer

Date: Wed, 25 May 2011 10:41:46 -0500
From: Robert Hatcher <rhatcher@fnal.gov>

Okay, backport onto R2.0 branch is done (and rebuilt); tag for
R2.0.5 has been pushed; code has been checked out into R2.0.5
release. All I need is a go ahead and I can rebuild the
R2.0.5 AtNuOutput package.

-robert

05/25/2011 11:12 am - Art Kreymer

Date: Wed, 25 May 2011 11:03:01 -0500
From: Rashid Mehdiyev <rmehdi@fnal.gov>
Hi Robert,

Please proceed with that rebuild.

Thanks,
Rashid

05/25/2011 02:11 pm - Art Kreymer

Date: Wed, 25 May 2011 11:53:25 -0500
From: Robert Hatcher <rhatcher@fnal.gov>

Done. (Sorry about the delay... I was consulting with someone
and not checking my mail).

05/27/2011 07:22 am - Robert Hatcher

- Status changed from New to Resolved

- % Done changed from 70 to 100

The fix has been implemented; backported to R2-0 branch; R2.0.5 tag for appropriate files has been pushed; the FNAL R2.0.5 (w/ and w/o -O) AtNuOutput has been re-built; running resumed. Jobs that were taking 50+ minutes now take less than half that.